# GB

## National Standard of the People's Republic of China

**GB xxxx — 200X**

Replaces GB16914-2003 and GB17905-2004

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# Safety Code for Gas Burning Appliances

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Issued by **General Administration of Quality Supervision, Inspection and Quarantine of The People's Republic of China**

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# Foreword

This Standard is divided into GB xxxx.1-200X and GB xxxx.2-200X.

All of the contents of this Standard are mandatory.

GB xxxx.1-200X

This Standard is formulated according to the foreign regulations and standards of the European Council Directive 90/396/EEC, “Approximation of the Laws of the Member States Relating to Appliances Burning Gaseous Fuels” (English Version), and the actual situation of gas burning appliances in China.

This Standard replaces GB 16914-2003.

Compared with GB 16914-2003, the major changes made to this Standard are as follows:

— the stipulation “the conformance judgement procedures and inspection rules should be implemented according to the requirements of CJ/T 222” has been added;

—Table 1, “Basic requirements, topical contents and the various corresponding standard requirements”, has been increased;

— Subsection 6, “Technical measures” has been increased;

— Subsection 7, “Conditions of selected type” has been increased;

— Subsection 8, “Installation of equipments” has been increased;

— the “Corresponding subsection numbers of 90/396/EEC and technical differences and their reasons” Have been deleted.

GB xxxx.2-200X

This Standard replaces GB 17905-1999, “Safety management regulation of gas-burning appliances for domestic use.”

Compared with GB 17905-1999, the major changes made to this Standard are as follows:

— the risks for the use of product and the requirements of control for hazardous and toxic substances has been added to Subsection 3 of the original Standard;

— a clause about the responsibility of producers and sellers to retrieve the scraped products has been added to Subsection 4 of the original Standard;

— the concrete requirements and limitations of product suitability test have been added to Subsection 5 of the original Standard;

— the inspection requirements of the controller and cut-off valve of product have been added to Subsection 7 of the original Standard;

— the content that the gaseity condition during inspection of accidents related to the product has been revised as the most unfavourable gaseity condition; the requirements for CO content in fumes have been revised and requirements regarding

the shutdown function of the safe cut-off valve have been revised according to the European standards;

— information has been added to Subsection 9 about the handling, recycling, reuse and recirculation requirements of scraped gas burning appliances.

— information has been added to Subsection 10 about the requirements of the limits of hazardous and toxic substances as well as pollution control for electronic information products and materials in gas burning appliance products.

Annexes A, B, C and D of the Standard are normative annexes.

This Standard was proposed by the Ministry of Housing and Urban-Rural Development of the People's Republic of China.

This Standard is under the central management of the North China Municipal Engineering Design & Research Institute, the residing unit of Urban-Rural Gas Standard Techniques under the Ministry of Housing and Urban-Rural Development.

The main drafting units of this Standard are: North China Municipal Engineering Design & Research Institute, _____, _____, _____, _____.

The main drafters of this Standard are:

**GB xxxx.1-200X**

# Safety Technical Conditions for Gas Burning Appliances

## 1 Scope

This Standard sets the safety technical requirements for the release to market, free circulation, conformance judgement and basic requirements of gas burning appliances (hereinafter referred to simply as burning appliances).

1.1 This Standard applies to:

a) Burning appliances that burn gaseous fuel for cooking, heating, producing hot water, refrigeration, lighting or washing, and are required to have their normal water temperature not exceeding 105$^{o}$C. They also include mechanical air-blast burners and heating equipment installed with this kind of burner.

b) Safety devices, control devices, regulating devices and other components (simply called fittings) independently sold on the market, installed in burning appliances or assembled as burning appliances, and these fitting should simultaneously meet the corresponding standard codes of products.

1.2 This Standard does not apply to industrial burning appliances designed for the implementation of industrial procedures in an industrial site.

1.3 The gaseous fuel indicated in this Standard refers to any gas-state fuel under the air pressure 101.3kPa and temperature 15$^{o}$C, and the quality and type of fuel should meet the requirements set out in GB 50028 and GB/T 13611.

1.4 Burning appliances indicated in this Standard as “under normal use” refer to burning appliances that are used in the following situations:

a) They are correctly installed according to the installation manual, and correct maintenance is performed regularly;

b) They are used in circumstances in which there is normal change in gas quality and normal pressure fluctuation of the supplied gas;

c) They are used correctly in accordance with the predetermined purposes of burning appliances, or can be reasonably used correctly according to the intended methods.

## 2 Normative references

The provisions of the following documents become provisions of this Standard after being referenced. For dated reference documents, all later amendments (excluding corrigenda) and versions do not apply to this Part; however, the parties to the agreement are encouraged to study whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Standard.

GB/T 13611 Classification and essential property of city gas

GB/T 16411 Universal test methods of gas burning appliances for domestic use

GB 16691 Portable butane cookers

GB 16692 Butane cylinders for portable butane cookers

GB 18111 Gas storage water heaters

GB 50016 Code of Design on Building Fire Protection and Prevention

GB 50028 Code for design of city gas engineering

GB 50045 Code for fire protection design of tall buildings

CJ/T 28 Chinese cooking gas appliances

CJ/T 29 Water boiling gas appliances

CJ/T 113 Gas-fired space heaters for domestic use

CJ/T 164 Domestic water saving devices

CJ/T 187 Steaming gas appliances

CJ/T 3030 Large gas cooker for cooking

CECS 215 Technical rules for application of gas-fired heating/hot-water combi boilers

CJ/T 222 Quality assessment procedures and test rules for gas burning appliances for domestic use

CJ/T 228 Gas-fired heating/hot-water combi boilers

**3 Release on the market and free circulation**

3.1 Burning appliances and fittings that meet the requirements of Subsection 1 of this Standard should take all necessary measures to ensure that they will not endanger the safety of people, domestic animals and properties under normal use; otherwise, they cannot be released onto the market and offered for use.

3.2 The standards of burning appliances and fittings that meet the requirements of Subsection 1 of this Standard should support the applicable basic requirements specified in Subsection 5 of this Standard.

3.3 Release onto the market and offer for use of burning appliances and fittings that meet the requirements of Subsections 4~7 of this Standard should not be forbidden, restricted or obstructed.

3.4 Burning appliances and fittings should meet the requirements of the related

national product standards. Only burning appliances and fittings that have been inspected and meet the related national standards may be released onto the market and circulated freely.

3.5 When appliances and fittings endanger the safety of people, domestic animals and properties under normal use, or if the safety performance of the appliances and fittings is damaged, the related institutions should perform corresponding tests. Meanwhile, appropriate measures should be taken by recalling any problematic appliances and fittings from the market, forbidding them and restricting them from being released onto the market and offered for use, especially when the above problems are caused by the following reasons:

a) the appliances and fittings do not meet the requirements of the related national standards;

b) improper implementation of the related national standards;

c) there are defects in the related national standards.

## 4 Judgement procedures of conformance and inspection rules

The judgement procedures of conformance and inspection rules should be implemented according to the regulations of CJ/T 222.

## 5 Basic requirements

5.1 General conditions

5.1.1 The design and manufacturing of burning appliances should ensure that, when they are under normal use according to Subsection 1.4 of this Standard, the operation is safe and does not bring any danger to people, domestic animals and properties.

5.1.2 The following manuals and warnings expressed in standard Chinese should be enclosed with burning appliances that are to be released onto the market:

a) Technical manual for fitters;

b) User and maintenance manual for users;

c) Special caution symbols, which should appear on both the burning appliances and package.

5.1.3 The technical manual for the fitter must include all explanations required for the installation, troubleshooting and maintenance of the product. Such explanations should ensure the correct installation, troubleshooting, maintenance, and safe operation and use of the burning appliances.

The manual should include the following contents:

a) Type of gas used;

b) Pressure of gas source used;

c) Circulated fresh air required;

1) Air supply required for burning;

2) When the device specified in Subsection 5.3.2.3 of this Standard is not provided with the burning appliance, the accumulation of any dangerous unburned gas mixtures should be avoided;

d) Dissipation conditions of the burning product;

e) The performance and assembling of mechanical air-blast burners and the heating device installed with such burners should meet the applicable basic requirements. A recommended assembling list should be provided at the appropriate places by the production unit;

f) Installation and troubleshooting methods for burning appliances.

5.1.4 The user and maintenance manual should include all explanations required for the safe use of the product, in particular explanations on the restrictions of its use, installation environment and ventilation requirements.

5.1.5 The warning marks printed on burning appliances and their packaging must clearly indicate the type of gas to be used, the pressure of the gas source and the restrictions of use, in particular the installation environment and ventilation requirements.

5.1.6 In general, the designed and manufactured fittings of burning appliances must be able to fulfil the predetermined purposes after they are assembled in burning appliances according to the installation manual.

The producers of the fittings of burning appliances must provide explanations concerning installation, troubleshooting, operation and maintenance.

5.2 Materials

5.2.1 The materials must be suitable for their intended purposes, and must be able to sustain anticipated technical, chemical and high temperature conditions.

5.2.2 The properties of the safety-related major materials must be guaranteed by the company that produced the burning appliances and the suppliers of materials.

5.3 Design and manufacturing

5.3.1 General rules

5.3.1.1 The stability and reliability of burning appliances under normal use must be guaranteed. There should be no instabilities, deformations, leakages, wearing, cutting, or any other aspect endangering the safety of the overall structure and fittings.

5.3.1.2 Condensed water produced in fumes when burning appliances are started or are being used shall not affect the safety of burning appliances.

5.3.1.3 In the case of fire occurring to the external part of the burning appliance, it should be ensured that the structure, materials and sealing performance of the burning

appliances provide the most minimised risk of explosion.

5.3.1.4 It must be guaranteed that the materials, structure and sealing performance of which the burning appliances are made meet the requirements, and that water and air do not enter into the appliances.

5.3.1.5 When the auxiliary power is normally fluctuated, the safety work of burning appliances should be ensured.

5.3.1.6 When the auxiliary power is abnormally fluctuated, invalid or resumed, it should be ensured that the burning appliances are under safe conditions.

5.3.1.7 The burning appliances should have the necessary protection measures against the potential harm of alternating current (AC) power. Burning appliances and fittings using AC power should meet the safety requirements for low-pressure electric appliances.

5.3.1.8 The design, assembling and strength of all burning appliance parts containing pressure must meet the requirements, should be able to bear mechanical and thermal stress, and should guarantee that no deformations shall happen to them to affect their safety within their life cycle limit.

5.3.1.9 When the safety, control and regulating devices of burning appliances malfunction, it must be ensured that the burning appliances are turned off or running under safe conditions.

5.3.1.10 When the burning appliances are equipped with safety devices and control devices, said devices must meet the corresponding product standards, and the functions of the safety devices should not be affected by control and regulating devices.

5.3.1.11 The burning appliances should be positioned or regulated at the manufacturing stage. Any parts that are not suitable for operation by user and fitter must be locked or lacquer sealed, and identified by marks. Other protection measures may also be taken. Non-professionals shall not dismantle and regulate these parts.

5.3.1.12 Clear markings and appropriate explanations for the handling and other safety, regulating, control and positioning devices should be made. Avoid making any error during this operation. The devices should be designed in a manner that prevents the occurrence of faulty operation.

5.3.2 Accidental release of gas

5.3.2.1 The airtightness (leakage) of the gas system of burning appliances should meet the requirements, and the safety of burning appliances should be ensured.

5.3.2.2 With regard to the procedures and structural design of burning appliances, it should be ensured that following ignition, re-ignition and flame extinguishment, the release of gas is controlled and safely exhausted promptly. Avoid any risks that may be caused by the accumulation of unburned gas inside the burning appliances.

5.3.2.3 Indoor burning appliances should be equipped with fire-extinguishing protection devices. For burning appliances that are equipped without a fire-extinguishing protection device, the location in which they are installed should be equipped with a gas alarm and cut-off device, and kept sufficiently ventilated, so as to prevent the accumulation of any unburned gases.

The size and ventilation conditions of the location in which the burning appliances are installed should be confirmed according to the properties of burning appliances.

5.3.3 Ignition

The ignition device of the burning appliances should belong to electric pulse ignition, piezoelectric ceramic ignition, or equivalent. It should also be ensured that, under normal conditions, the ignition device should meet the following requirements:

a) Ignition and re-ignition are stable and safe;

b) Cross-ignition should be stable and safe.

c) The safety of the burning appliances should be ensured if there is any unsuccessful or accidental fire extinguishing.

5.3.4 Burning

5.3.4.1 Ensure that the flame is burning stably when the burning appliances are in normal use. Hazardous substances in the burning product shall not exceed the limit of its concentration. For unsupervised burning appliances that are running continuously, there supervisory control should be established for its fume exhaust and the concentration of its hazardous substances.

5.3.4.2 For burning appliances equipped with flues, it must be ensured that, under normal use, the structure, design and airtightness of the fume exhaust system should meet the requirements and shall not leak.

5.3.4.3 For burning appliances equipped with flues, necessary protection measures must be taken to ensure that no backflow of fume appears under abnormal fume exhaust conditions.

5.3.4.4 Ensure that in the room using independent flue-free heating appliances for domestic use and flue-free fast water heaters, the concentration of carbon monoxide (CO) should not exceed the related indoor environmental hygiene standard code. The burning appliances must have the supervisory control device of indoor CO concentration and the corresponding gas cut-off device. Ensure that within the predetermined period of use of burning appliances, the health of people shall not be endangered.

5.3.5 Synthetic use of energy

Under the prerequisites that the technical level is fully reflected and the safety factors are considered, the energy effect and energy consumption of burning

appliances should meet the related standards. Condensed burning appliances should fully consider the avoidance of corrosion caused to the flue and other parts by the condensed fluid.

5.3.6 Temperature

5.3.6.1 For the parts of burning appliances located close to the floor or other surfaces, the temperature rise of the floor and surfaces of the surrounding substances should meet the requirements set out in the related standards. Its temperature is restricted from reaching the extent that endangers the surrounding buildings.

5.3.6.2 The rise in the surface temperature of operating parts of burning appliances, such as the button and handle, shall cause no harm to users.

5.3.6.3 With the exception of surfaces and parts relating to heat transfer, the surface temperature of the external parts of burning appliances for domestic use under normal conditions shall not cause any harm to users, especially children. Appropriate response time must be considered for users.

5.3.7 Food and domestic water

Under the prerequisite that the related requirements are not violated, the materials and parts for manufacturing burning appliances shall not contain heavy metals, such as cadmium, lead, mercury, etc. If they happen to come into contact with food and domestic water, their quality shall not be damaged.

5.4 Comparison of the basic requirements, topical contents and requirements of different standards for burning appliances

A list of the comparison of the basic requirements, topical contents and requirements of different standards for burning appliances is shown in Table 1.

**Table 1 Comparison of the basic requirements, topical contents and requirements of different standards for burning appliances**

| Basic Require-ments | Topical Contents | Requirements of Different Standards |
|---|---|---|
| 5.1 | General conditions | |
| 5.1.1 | Operation safety | When the burning appliances are under normal use, no danger should be brought to people, domestic animals and properties. The burning appliances' adaptability to gas, the gas supply and exhaust of burning appliances, the regulation, control and safety devices of burning appliances, the fixing and connection of burning appliances, the materials and thickness of burning appliances, the operability of burning appliances, the airtightness, heat flow volume, burning condition, etc. of burning appliances should meet the requirements set out in the related standards. |

| | | |
|---|---|---|
| 5.1.2 | Manual and special warning marks | a) Technical manual for fitters;<br>b) User's and maintenance manual for users;<br>c) Dedicated warning marks (on burning appliances and package). |
| 5.1.3 | Manual of installation techniques | Gas type, pressure, gas supply and exhaust, installation requirements, etc. |
| 5.1.4 | User manual | Knowledge about the use and maintenances of burning appliances. |
| 5.1.5 | Special warning marks | Warning contents on burning appliances and package, such as the must-read manual, gas type, pressure, gas supply and exhaust, and so on. |
| 5.1.6 | Fittings of burning appliances | The regulation, control and safety devices of burning appliances should reach the predetermined purposes. |
| 5.2 | Materials | |
| 5.2.1 | Properties of materials | No pollution shall be caused to water and food. The quality and thickness of materials should meet the requirements for its use. |
| 5.2.2 | Certificates of guarantee for materials | The properties of the important safety-related major materials have to be guaranteed. |
| 5.3 | Design and manufacturing | |
| 5.3.1 | General rules | |
| 5.3.1.1 | Reliability and durability | The materials, structure, strength, connection and fixing ways, valves, flame detection device, etc. of burning appliances should meet the related requirements. |
| 5.3.1.2 | Condensation of fume exhaust | The condensed water for fume exhaust shall not affect the safety of burning appliances. |
| 5.3.1.3 | Risk of explosion | The materials, structure and airtightness should meet the requirements. |
| 5.3.1.4 | Leaking water and air | The materials, structure and airtightness should meet the requirements. |
| 5.3.1.5 | Normal fluctuation of auxiliary energy | When the auxiliary energy is under the conditions of normal fluctuation, disconnection and resumption, the safety of burning appliances should be guaranteed, and the functions of the safety devices, control devices and regulating devices should meet the specified requirements. |
| 5.3.1.6 | Abnormal fluctuation of auxiliary energy | When the auxiliary energy is under the conditions of normal fluctuation, disconnection and resumption, the safety of burning appliances should be guaranteed, and the functions of the electromagnetic compatibility, safety devices, control devices and regulating devices should meet the specified requirements. |

| | | |
|---|---|---|
| 5.3.1.7 | Safety of AC power | The parts using AC power must meet the related standard code for low-pressure electric appliances. |
| 5.3.1.8 | Pressurised parts | The design, assembling and strength of the pressurised parts have to meet the standard code. |
| 5.3.1.9 | Malfunction of safety devices | Safety, regulation and control devices, including flame detection device, gas regulator, discharge regulator, cooling fan, water-gas linkage device, atmospheric environmental sensor (of CO), overheat protection device, series valves of gas system, automatic cut-off valve, air supply device (Type C burning appliances), gas/air proportional control device, and so on, should be ensured to be safe under normal and abnormal use. |
| 5.3.1.10 | Safety regulation | The functions of safety devices should not be affected by regulating and control devices. |
| 5.3.1.11 | Protection of parts specified by manufacturer | The gas pressure regulator, the nozzle of burning appliances or discharge regulator, the air sensor (CO) for environmental protection, and so on should be regulated and preset by the manufacturer when the products are delivered from the factory, and should take the protection measures of fixing or sealing. They shall not be dismantled and regulated by non-professional people. |
| 5.3.1.12 | Marking and identification of | The cock and temperature controller of burning appliances that regulate and control the turning on and off and regulating of the parts should be clearly identified and marked. |
| 5.3.2 | Accidental gas release | |
| 5.3.2.1 | Danger of gas leakage | The airtightness (leakage) of the gas system should meet the related standard code. |
| 5.3.2.2 | Danger of gas accumulation inside burning appliances | The gas release after ignition, re-ignition and flame extinguishment should be restricted. There should be fire-extinguishment protection device installed. The installation of valves for burning appliances should meet the requirements, and the structure of burning appliances should guarantee the immediate dispersion of the released gas. For example, fire cannot be ignited until the burner is exposed outside, the ventilation hole is attached to the burner, and the door of oven is opened. |
| 5.3.2.3 | Danger of gas accumulation inside a room | Indoor burning appliances should be equipped with fire-extinguishment protection device. For the burning appliances equipped with no fire-extinguishment protection |

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|---|---|---|
| | | device, the place where they are installed should be equipped with a gas alarm and cut-off device, and kept sufficiently ventilated. After the sudden fire extinguishment of burning appliances, accidents should be prevented from occurring. |
| 5.3.3 | Ignition | The ignition, re-ignition and long-term naked flames should be stable and safe. |
| 5.3.4 | Burning | |
| 5.3.4.1 | Working conditions of burning | The flame should be stable. The CO content in fumes should meet the standard code. |
| 5.3.4.2 | Fume exhaust | The gas supply/exhaust funnel of the enclosed (Type C) burning appliances as well as the gas exhaust funnel of semi-closed-type (Type B) burning appliances should be mechanically sealed well, and meet the specified requirements. |
| 5.3.4.3 | Fume exhaust into a room (referring that the burning appliances equipped with flue are under abnormal ventilation condition) | The semi-closed-type (Type B) burning appliances should be installed according to the balanced-type partition room, or established with a safety device that cuts the gas supply before the burning product installed in the room has reached the dangerous volume, and a fume-block safety device that prevents the backflow of fume. |
| 5.3.4.4 | Limits of CO and $CO_2$ concentration inside the room (referring to the Type A burning appliances, such as the flue-free water heater and heating appliances, etc.) | The indoor hygiene conditions should be ensured. The CO and $CO_2$ concentration in the air indoors shall not exceed the standard code. The burning appliances should be equipped with a reliable cut-off device for the excessive CO and $CO_2$ concentration indoors. |
| 5.3.5 | Reliable energy use | The energy effect and energy consumption of burning appliances should meet the standard code. The condensed burning appliances should fully avoid damage to the flue and other parts by the condensed fluid. |
| 5.3.6 | Temperature | |
| 5.3.6.1 | Floor and neighbouring surfaces | The surface temperature rise of the installed parts of burning appliances should meet the standard code. |
| 5.3.6.2 | Control handle | The surface temperature rise of the control handle of burning appliances should meet the standard code. |
| 5.3.6.3 | External surface of burning appliances | The temperature rise on the external surface of burning appliances has to meet the standard code. |
| 5.3.7 | Safety of food and domestic water | Materials that come into contact with food and domestic water shall not affect their quality. The temperature rise of water heater |

| | | |
|---|---|---|
| | | in times of the stoppage of water supply, as well as the temperature rise of the oven with ignitor during the ignition period of ignitor should meet the standard code. |

## 6 Technical measures

6.1 Structure

6.1.1 The structure of burning appliances and their parts should consider safety and durability requirements, such as the prevention of gas leaks, prevention of fire, etc. Under ordinary conditions for transportation, installation and use, the appliances should not be damaged or deformed in a manner that would obstruct their use.

6.1.2 The different parts should be accurate and flexible.

6.1.3 When burning appliances are used after normal installation, there should be no mobility or inclination.

6.1.4 The gas interface of burning appliances should be connected by the taper pipe thread, which should be attached to a location available for easy connection.

6.1.5 The specified valves of burning appliances should be possessed.

6.1.6 The gas path should meet the following requirements:

a) The airtightness of the gas path must meet the related standards. During ordinary transportation, installation and use, its airtightness shall not be damaged;

b) The gas pipe should be installed in a location that will not overheat or become corroded; otherwise, protection measures should be taken;

c) The connections should be firmly connected by welding, thread, bolt, nut, screw, etc.;

6.1.7 The burners should be assembled according to the following requirements:

a) Kindling burners (ignition burners), small-fire burners (long-term naked fire) and main-fire burners should be firmly installed at the specified position. Ensure that they and the nozzle, burning chamber, electric ignition device, safety device, and so on are fixed at correct positions, and would not be moved or fall down during ordinary use.

b) With the exception of special parts of burning appliances, it is not suitable to install them in overheated or damaged locations.

6.1.8 Burning appliances should be confirmed as available for ignition in the operation site of ignition through visual measurement, mirror, voltmeter, indicating light, etc. Burning appliances with ignition that are not confirmed must be installed with the fire-extinguishment protection device that meets the requirements.

6.1.9 Burners, heat exchangers and other main parts should be able to be regulated or

changed.

6.1.10 When in use or being cleaned, the sides and ends of the parts that may be touched by the hands should be smooth.

6.1.11 When cleaning or dismantling parts, the operation should be principally carried out using common tools.

6.1.12 The screws for assembling different parts should be firmly installed. Parts that are dismantled during maintenance and inspection should be available for repeated use.

6.1.13 Burning appliances installed on walls, erected columns or on the floor should be available for easy installation and dismantling. Ordinary piping operations shall not cause any abnormal phenomenon, and should be installed firmly.

6.2 Materials

6.2.1 The materials used on burning appliances should be able to bear mechanical, chemical and thermal actions under ordinary use and maintenance.

6.2.2 With the exception of sealed objects (including the diaphragm, rubber valve body) and grease-sealed materials, the gas path and burner should be made of metallic materials with a melting point greater than 500$^{o}$C; the fume path should be made of a non-burning material with a melting point greater than 350$^{o}$C, and should meet the following requirements:

a) Corrosion-resistant metallic materials meeting the related standard code or corrosion-resistant material above the equivalent standard should be used. The minimum nominal thickness of material should meet the requirements set out in Tables 2 - 4. The actual thickness of parts should be greater than 0.8 time of the nominal thickness.

b) The metallic material for performing electric plating of the surface should take a 24-hour test according to the requirements of GB/T 16411, and should be confirmed corrosion-free;

c) The metallic material for surface coating should take a 24-hour test according to the requirements of GB/T 16411, and should be confirmed to have no rusting, bubbling and shedding phenomena;

d) The metallic material for surface enamelling should perform ballistic impact test according to the requirements of GB/T 16411, and should be confirmed to have no shedding phenomenon;

e) Steel glass materials should perform impact resistance test according to the related standard code, and should be confirmed to have no breaking phenomenon;

6.2.3 Sealed objects, sealing materials and other non-metallic sealing materials used where gas passes through should meet the following requirements:

a) Rubber, plastic and other materials of the sealed object should be tested under the gas-resistant performance test according to the requirements of GB/T 16411, and the quality change rate should be less than 20%, without any softening and brittling phenomena to affect their use;

b) Rubber product should perform gas-resistant performance test according to GB/T 16411, and the pentane penetration per hour should be less than 5mg;

c) Grease-sealed material should perform gas-resistant performance test according to GB/T 16411, and the quality change rate should be less than 10% at 20°C, and less than 25% at 4°C.

6.2.4 The conduction material should be copper and the material possessing the electrical performance, thermal stability performance and mechanical stability performance should be copper alloy, stainless steel or above. With regard to the necessary materials to be used at the portion requiring elasticity and at other portions, such restriction is inapplicable when there is no danger.

6.2.5 The heat-retaining and heat-insulating materials of the gas path, burner and electrical parts should perform gas-resistant performance test according to GB/T 16411, and should not be burned or should be extinguished within 10 seconds. However, such a restriction does not apply to the burning of heat-retaining and heat-insulating materials if they will not cause the danger of shock or fire.

**Table 2 Minimum nominal thickness of the parts of burning appliances**

| Material | Burner | Gas path | Water path | | Burning chamber | Heat transfer tube | Support and frame | Panel and shell |
|---|---|---|---|---|---|---|---|---|
| | | | Pipe | Container | | | | |
| Cast parts | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Die-cast parts | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Stainless steel | 0.5 | 0.5 | 1.0 | 1.0 | 0.5 | 0.5 | 1.0 | 0.5 |
| Steel material for surface treatment | 1.0 | 1.0 | -- | 1.5 | 1.0 | 1.0 | 1.5 | 0.8 |
| Aluminium and aluminium alloy | 1.0 | 1.0 | 1.0 | 3.0 | 1.0 | 1.0 | 1.5 | -- |
| Copper and copper aluminium | 1.0 | 1.0 | 0.8 | 1.5 | 1.0 | 1.0 | 1.5 | -- |

Remarks: 1. The water pressure of water storage tank, burning chamber and heat transfer tube should be smaller than or equal to 0.3MPa.

2. The steel material for surface treatment refers to the steel material having gone through anti-corrosion treatment, e.g. enamelling.

**Table 3 Minimum nominal thickness of the water storage milling parts (0.3MPa• P• 0.6 MPa) mm**

| Carbon steel, aluminium | | | Protective steel, stainless steel, copper | | |
|---|---|---|---|---|---|
| a | b | c | a | b | c |
| 4.0 | 3.0 | 2.9 | 2.0 | 2.0 | 1.0 |
| Remarks: 1. The water pressure of water storage tank, burning chamber and heat transfer tube should be greater than 0.3MPa , smaller than or equal to 0.6MPa.<br>2. a: The wall of the burning chamber that has contact with water and fire, and the horizontal wall on the surface of heat transmitter (water-fire heat exchange, and so on).<br>b: The rigid surface r that has contact with water, e.g. the surface of the heat transmitter outside the burning chamber (water-water heat exchange, and so on).<br>c. The pipeline of heat transmitter (cold, hot water pipes, and so on). | | | | | |

**Table 4 Minimum nominal thickness of the milled water storage parts (0.3MPa• P• 0.6 MPa) mm**

| Rated heat load (kW) | Thin graphite cast iron, aluminium | Spheroidal graphite cast iron, cast iron, copper |
|---|---|---|
| • 35 | 3.5 | 3.0 |
| • 35 | 4.0 | 3.5 |
| Remarks: The water pressure of water storage tank, burning chamber and heat transfer tube should be greater than 0.3MPa , smaller than or equal to 0.6MPa. | | |

6.2.6 The material plate numbers, thickness and execution standards of the main parts of burning appliances (Table 2 and Table 3) should be publicized in the product manual.

6.3 Safety devices

6.3.1 Burning appliances for domestic use should be equipped with the safety devices specified in Table 5. The performance of the safety devices should meet the requirements of the related standards.

**Table 5 Safety devices of burning appliances for domestic use**

| Serial No | Safety Devices | Scope of Application |
|---|---|---|
| 1 | Automatic ignition | Different kinds of burning appliances. |
| 2 | Fire observation | Different kinds of burning appliances. |
| 3 | Fire-extinguishment protection | Different kinds of burning appliances. |
| 4 | Indoor atmospheric environmental protection | Vertically placed water heaters, air heater, drying machine and heater inside the room. |

| | | |
|---|---|---|
| 5 | Overheat protection | Shell of closed-type water heater inside bathroom. |
| 6 | Excessive temperature protection | Water systems, like rice pot, water heater, and the heating/hot-water combination (combi) boiler, and so on. |
| 7 | Air current supervision and control | Compulsorily arrayed burning appliances. |
| 8 | Overpressure protection of gas system | Gas burning system of portable burning stove (portable cooker). |
| 9 | Overpressure protection of hot water system | Enclosed-type volumetric water heater and closed-type heating system. |
| 10 | Anti-frozen protection | Water systems, like water heater and heating appliances. |
| 11 | Flue-block protection | Fume exhaust outlet of semi-closed-type water heater and heating appliances. |
| 12 | Fume backflow protection of flue | Semi-closed-type water heater and heating appliances. |
| 13 | Electrical grounding protection | Burning appliances with anti-shock protection grades being Types I, II and III. |
| 14 | Anti-explosion protection for flue of firebox | Semi-closed-type and closed-type water heater and heating appliances. |
| 15 | Fume lead-out device | The air exchange fan and range hood attached to the vertically placed stove and water heater |
| 16 | Gas alarm and cut-off device | Installation place of burning appliances with nobody's supervision and the place with poor ventilation. |

6.3.2 Burning appliances for public use (commercial use) should be installed with safety devices according to the technical needs of heating. The performance of safety device should be able to meet the requirements of the related standards.

6.4 Performance

6.4.1 Safety performance of burning appliances

a) Pressure resistance and airtightness

(1) The airtightness and airtight force of gas system (restricted to automatic valves only) should meet the specified requirements.

(2) The pressure resistance and airtightness of water system should meet the specified requirements.

b) Flame stability

When adopting limit gas to test the corresponding pressure 0.5Pn or 1.5Pn, the flame should be stable.

c) Carbon monoxide (CO) content in fume

(1) For open-type (vertically placed) burning appliances, it should not be greater than 0.1% (a = 1).

(2) For semi-closed-type and closed-type burning appliances, it should not

be greater than 0.2% (a = 1).

The testing condition: both are tested by adopting limit gas and 1.5Pn or the maximum pressure.

d) Electrical performance

The grounding, insulation, and so on should meet the specified requirements.

6.4.2 Energy efficiency and energy consumption of burning appliances

The energy efficiency of burning appliances should meet the related standard code. The energy consumption of the gas stoves, water heaters and the heating/hot-water combi boilers for domestic use as well as the Chinese cooking stove and large cooking stove for public use should meet the requirements of Subsections 6.4.3 ~ 6.4.5.

6.4.3 Energy consumption gradation of gas stoves for domestic use

a) The rated heat load of the main fire of gas stoves for domestic use should be 3.0 ~ 3.5kW. The energy consumption of the gas stoves for domestic use should meet the requirements set out in Table 6.

**Table 6 Energy consumption gradation of gas stoves for domestic use**

| Serial No | Heat load of Burner (kw) | Energy consumption index (3.5kw = 1) | Identification of energy consumption grades (colour) | Energy consumption grade (letters) |
|---|---|---|---|---|
| 1 | 2.5 | 0.71 | Green | A |
| 2 | 3.0 | 0.86 | Yellowish green | B |
| 3 | 3.5 | 1.00 | Yellow | C |
| 4 | 4.0 | 1.14 | Orange | D |
| 5 | 4.5 | 1.29 | Red | E |

b) The energy consumption gradation of gas ovens should be confirmed according to the effective capacity of ovens. The energy consumption gradation of gas ovens for domestic use should meet the requirements set out in Table 7.

**Table 7 Energy consumption gradation of gas ovens for domestic use**

| Serial No | Heat load (kw) | Energy consumption index (3.0kw = 1) | Identification of energy consumption grades (colour) | Energy consumption grade (letters) |
|---|---|---|---|---|
| 1 | 2.0 | 0.67 | Green | A |
| 2 | 2.5 | 0.83 | Yellowish green | B |
| 3 | 3.0 | 1.00 | Yellow | C |
| 4 | 3.5 | 1.17 | Orange | D |
| 5 | 4.0 | 1.33 | Red | E |

6.4.4 Energy consumption gradation of gas-fired water heaters and the

heating/hot-water combi boilers for domestic use

a) Water discharge limit of the water-saving domestic water apparatus for civil use (CJ 164-2002 “Water-saving domestic water apparatus”).

(1) The water discharge of the water-saving shower for bathing should not be greater than 0.15L/s (9L/min.).

(2) The water discharge of the water-saving nozzle for cleaning should not be greater than 0.15L/s (9L/min.).

b) The water discharge rate of the gas-fired water heaters for domestic use and the heating/hot-water combi boilers for bathing should be 7 ~ 9L/min. The energy consumption gradation should meet the following requirements:

(1) The energy consumption gradation of the fast water heaters and the heating/hot-water combi boilers for domestic use should meet the requirements of Table 8.

**Table 8 Energy consumption gradation of gas-fired water heaters and heating/hot-water combi boilers for domestic use**

| Serial No | Water discharge rate (L/min.) | Heat load (kw) | Energy consumption index (9L/min. = 1) | Identification of energy consumption grades (colour) | Energy consumption grade (letters) |
|---|---|---|---|---|---|
| 1 | 5 and below | 10 | 0.56 | Green | A |
| 2 | 7 and below | 14 | 0.78 | Yellowish green | B |
| 3 | 9 and below | 18 | 1.00 | Yellow | C |
| 4 | 11 and below | 22 | 1.22 | Orange | D |
| 5 | 13 and below | 26 | 1.44 | Red | E |

(2) The energy consumption gradation of the volumetric gas-fired water heaters and the heating/hot-water combi boilers for domestic use should be confirmed according to the converted water discharge rate (L/min.) of heat load and the requirements set out in Table 8.

6.4.5 Energy consumption gradation of Chinese cooking stoves and large cooking stoves for public use

a) The rated heat load for the main fire of Chinese cooking stoves should be 29.1 ~ 34.9kW, and the energy consumption gradation should meet the requirements of Table 9.

**Table 9 Energy consumption gradation of Chinese cooking stoves**

| Serial No | Heat load (kw) | Energy consumption index (34.9kw = 1) | Identification of energy consumption grades (colour) | Energy consumption grade (letters) |
|---|---|---|---|---|
| 1 | 23.3 | 0.67 | Green | A |
| 2 | 29.1 | 0.83 | Yellowish green | B |

| | | | | |
|---|---|---|---|---|
| 3 | 34.9 | 1.00 | Yellow | C |
| 4 | 40.7 | 1.17 | Orange | D |
| 5 | 46.5 | 1.33 | Red | E |

b) The rated heat load for the main fire of the large cooking stoves should be 52.3 ~ 58.1kW, and the energy consumption gradation should meet the requirements of Table 10.

**Table 10 Energy consumption gradation of large cooking stoves**

| Serial No | Heat load (kw) | Energy consumption index (34.9kw = 1) | Identification of energy consumption grades (colour) | Energy consumption grade (letters) |
|---|---|---|---|---|
| 1 | 46.5 | 0.80 | Green | A |
| 2 | 52.3 | 0.90 | Yellowish green | B |
| 3 | 58.1 | 1.00 | Yellow | C |
| 4 | 64.0 | 1.10 | Orange | D |
| 5 | 69.8 | 1.20 | Red | E |

6.5 Quality evaluation of burning appliances for domestic use

6.5.1 Burning appliances that meet the quality standards of burning appliances for domestic use can perform itemised scoring of burning appliances according to the different performance indicators specified in Table 11.

**Table 11 Performance indicators of burning appliances for domestic use and the corresponding itemized scoring**

| Evaluation item | | Itemized scoring | Performance indicator | | Way of verification |
|---|---|---|---|---|---|
| | | | Stove | Water heater, two-purpose stove | |
| Safety | Airtightness of gas system | 20 | Valve turned on and off, air pressure 10kPa, no pressure reduction for 1 min. | Same as the left | Inspection report |
| | | 10 | Valve turned on and off, air pressure 5kPa, no pressure reduction for 1 min. | Same as the left | Inspection report |
| | | 5 | Leakage specified in the current standards | Same as the left | Inspection report |
| | CO content in fume | 20 | 1-1 gas, 0.05% (• = 1) | Same as the left | Inspection report |
| | | 10 | 1-1 gas, 0.10% (• = 1) | Same as the left | Inspection report |
| | | 5 | Content specified in the current standards | Same as the left | Inspection report |

| | | | | | |
|---|---|---|---|---|---|
| Economi-cality | Energy-saving, water-saving and environmental protection | 30 | Heat load of main fire $Q_z$ • 3.5kW | Fast water discharge rate G • 9L/min. Volumetric heat load Q • 18kW | Inspection report |
| | | 20 | Heat load of main fire $Q_z$ • 4.0kW | Fast water discharge rate G • 11L/min. Volumetric heat load Q • 22kW | Inspection report |
| | | 10 | Heat load of main fire $Q_z$ • 4.5kW | Fast water discharge rate G • 13L/min. Volumetric heat load Q • 26kW | Inspection report |
| Durability | Age limit | 30 | 20 years | 20 years | Inspection report |
| | | 20 | 15 years | 15 years | Inspection report |
| | | 10 | Age limit of scrap judgement specified in the current standards | Same as the left | Inspection report |

6.5.2 According to the total scores per item acquired from Table 11, the burning appliances for domestic use can have their quality grades confirmed based on the following gradation in terms of scores (full score is 100 scores).

a) Grade A ($1^{st}$-class product): The total scores per item are greater than or equal to 90 scores;

b) Grade B ($2^{nd}$-class product): The total scores per item are greater than or equal to 75 scores, and less than 90 scores;

c) Grade C ($3^{rd}$ class product): The total scores per item are greater than or equal to 60 scores, and less than 75 scores;

d) Grade D (passed product): The total scores per item are greater than or equal to 30 scores, and less than 60 scores.

## 7 Conditions of selected type

7.1 Supporting conditions

7.1.1 City gas

a) The types and basic properties of city gas should meet the requirements set out in GB/T 13611.

b) The quality of city gas and the pressure fluctuation range of the supplied gas should meet the requirements set out in GB 50028.

7.1.2 Water supply and drainage

a) The quality, volume and pressure of the supplied water should satisfy the

need for the running of burning appliances.

b) The drainage should satisfy the need for the running of burning appliances.

7.1.3 Electrical conditions

a) The voltage, frequency and power should satisfy the need for the running of burning appliances.

b) There should be good grounding.

7.1.4 Installation Location

a) The installation location of burning appliances should have gas supply/exhaust facilities that match the burning appliances and meet the specified requirements. Gas and fume leaks in the running process of burning appliances should not cause any harm to the environment.

b) In the basement, semi-basement, or the closed-typed room without any door or window for direct access to outdoor space and with poor ventilation, there should be a compound alarm and cut-off device in case of gas and fume leakage.

7.2 Conditions of burning appliances

7.2.1 Gas stoves for domestic use

a) The required wind volume, wind pressure, structural type and outlook dimensions of stoves should be able to match with their range hoods.

b) The embedded stove should match with the stove cabinet, which should guarantee the air supply for once. The opening and closing of the door of the stove cabinet shall not affect the stability of flame.

c) Stoves should be equipped with ignition and fire-extinguishment protection device. Rice pots should be equipped with temperature control device. Portable stoves should be equipped with overpressure protection device.

d) The heat load of the main fire of stove (including oven and baking apparatus) should be controlled within a range of 3.0 ~ 4.0kW.

e) Each burner should be able to be ignited by matches and ignition rod.

f) The status of burner should be easy for observation.

g) The supporting frame of stove should be able to adapt to pan and wok. One of the burners should be able to adapt to a pan at a diameter of 100mm. The strength of the supporting frame of stove should not affect its normal use. When a net load of 100N is placed on the supporting frame of stove, no deformation or damage should be caused. When 500N horizontal component force (canting pull at $40^{o}$) is placed in the front part of the shell for 15 min., there should be no transient deformation of above 2.5mm caused on the stove shell.

h) Other requirements of the related standards.

7.2.2 Gas-fired fast water heaters for domestic use

7.2.2.1 Vertically placed (Type A) water heaters should meet the following requirements:

a) The rated heat load shall not be greater than 12kW.

b) There should be an atmospheric environmental sensing device. When the CO content in the air at the height 1.5m in a room installed with water heater is greater than 0.01% and the $CO_2$ content is greater than 2.5%, the gas supply should be able to be reliably cut off.

c) The fume exhaust temperature should be higher than the dew point temperature by 15$^{o}$C.

d) There should be a 20-minute timer device.

e) It should only apply to kitchen cleaning for a short while and intermittently.

7.2.2.2 Semi-closed-type (Type B) water heaters should meet the following requirements:

a) There should be the installation of a gas cut-off device in the case of backflow fumes during working conditions as well as a flue-block device in case of disuse condition.

b) When using air exchange fan and range hood for fume exhaust, the water heater should be equipped with a linkage device interlocking with the fume exhaust device. Its fume exhaust temperature should be higher than the dew point temperature by 15$^{o}$C.

7.2.2.3 The closed-type (Type C) water heaters should meet the requirements of the related standards.

7.2.2.4 The hot water production rate of water heaters should adopt the requirements of CJ 164.

7.2.3 Gas-fired volumetric water heaters

a) The type, structure and safety control devices of water heater should meet the requirements of GB 18111.

b) The heat storage of water heater should satisfy the bathing need for once, and the heat storing time should not be less than 30 min.

Remarks: Heat storing time refers to the interval that the volumetric water heater stops heating.

7.2.4 Gas-fired heating/hot-water combi boilers

a) The type, structure and safety control devices of water heater should meet the requirements set out in CJ/T 228.

b) The selected type, fume design, system design, installation, troubleshooting, operation and maintenance of water heater should meet the requirements of CECS 215.

7.2.5 Other burning appliances for domestic use

a) Portable butane gas stoves should meet the requirements of GB 16691.

b) Portable butane gas bottles for stove use should meet the requirements of GB 16692.

c) Gas heating appliances for domestic use should meet the requirements of CJ/T 113.

7.2.6 Other burning appliances for business use

a) Gas-fired large cooking stoves should meet the requirements of CJ/T 3030.

b) Chinese gas cooking stoves should meet the requirements of CJ/T 28.

c) Gas water boilers should meet the requirements of CJ/T 29.

d) Gas steamers should meet the requirements of CJ/T 187.

## 8 Installation of equipments

8.1 Installation Location

8.1.1 The following rooms and parts of a building may be installed with burning appliances:

a) Kitchen;

b) Special room;

c) Outdoors, external corridor, and unenclosed balcony (all of them should be equipped with facilities sheltering from wind, rain and snow).

8.1.2 The following rooms and parts of a building cannot be installed with burning appliances:

a) Rooms such as bedroom, living room and bathroom;

b) Around stairs and safety exits (not restricted to the places beyond 5m);

c) Places piled up with inflammable and explosive objects;

d) Places with wires and electrical appliances.

e) Liquefied petroleum gas (LPG) and LPG-air mixture burning appliances shall not be placed underground or partially underground.

8.1.3 It is not suitable to install the burning appliances underground and in the semi-underground of a building. Conditionally restricted, the burning appliances installed in the underground or semi-underground of a building should meet the following requirements:

a) There should be hand-operated and automatic mechanical anti-explosion ventilation devices underground or in the semi-underground. There should also be the installation of automatic alarm and cut-off device for the leakage of anti-explosion gas and carbon monoxide, and the device should interlock with the mechanical ventilation device.

b) Safety measures underground, like anti-explosion, pressure relief, and so on, should meet the requirements of GB 50016 and GB 50045.

8.2 Installation of furnace body

8.2.1 The installation of furnace body should meet the following requirements:

a) The furnace body should be installed on the fire-resistant wall, furnace platform or floor that can bear the weight of furnace body.

b) The installation of furnace body should be firm, kept vertical, and cannot be slanted.

c) When the furnace body is installed above other burning appliances, the net horizontal distance between the furnace body and other burning appliances shall not be less than 30cm.

d) There should be necessary operation and maintenance space around the furnace body, and the space should satisfy the requirements of the manual.

8.2.2 The place installed with furnace body should be available for easy connection with gas supply/exhaust pipe, heating water supply/return pipe, and the domestic hot/cold water pipe.

8.2.3 The lowest point of the place installed with furnace body should be floor drained (restricted to the burning appliances with heating water supply/return pipe).

8.3 Connection of gas pipe

8.3.1 The gas type and the pressure of power supply have to be consistent with the indication shown on the plate of burning appliances. When they are inconsistent, they must be changed or re-regulated by the suppliers of burning appliances

8.3.2 The gas pipe and the furnace body should be connected to a metallic pipe with threaded adaptor, or the aluminium/plastic composite pipe especially for gas. There should be a valve attached to the front part of the furnace.

8.3.3 The gas pipe should meet the requirements of maximum input power (load) of burning appliances.

8.3.4 When the pressure of supplied gas is greater than 5kPa, independent pressure regulator should be placed in front of the gas meter.

8.3.5 The gas supply pipe of burning appliances is connected with the main pipe. The dimensions of the main pipe should be greater than the dimensions of the branch pipe of burning appliances. The diameter of the connecting pipe between burning appliances and gas meter should not be less than the diameter of the gas input pipe on burning appliances, and should be confirmed according to the maximum discharge, length and allowed pressure loss of pipe.

8.3.6 When using artificial gas, a filter or filtering net should be installed at the gas inlet.

8.3.7 The airtightness of gas pipe and valve should go through the 5kPa pressure test.

During the inspection, the gas valve of burning appliances should be turned off. It is prohibited to make an overpressure test that may possibly damage the gas valve of burning appliances.

8.4 Connection of water pipe (restricted to heating/hot-water combi boilers and water heaters only)

8.4.1 The diameter of pipe should not be smaller than the diameter of the connecting pipe of the furnace body. The dimensions of the main pipe should be greater than the dimensions of the branch pipes of the heating/hot-water combi boiler. The gas discharge and resistance loss while running through the pipe should meet the designed requirements.

8.4.2 Below the pressure relief, spillway, etc. of furnace body, there should be drainage facility. When the drainage is overheated, effective temperature reduction measures should be taken. There should be no valve on the connecting pipe.

8.4.3 The lowest part of the heating system should be equipped with drainage valve, whereas its highest part and the upper part of the radiator should be equipped with gas exhaust valve. In the system, there should be at least an automatic gas exhaust valve.

8.4.4 The water tank of the open-type heating appliances should be installed at the highest place of the heating system. There should be no valve equipped on the expansion pipe.

8.4.5 A filter should be installed on the water return pipe of heating system.

8.4.6 There should be valves equipped at the warm water inlet and outlet as well as the cold water inlet of the furnace body.

8.4.7 When the pressure of the supplied domestic cold water exceeds 0.6MPa, a depressurising valve should be provided. When it is lower than the lowest working pressure of equipment, a pressure pump should be additionally provided.

8.4.8 The surface of the domestic hot water pipe should be winded by heat-retaining material to retain its temperature. The thickness of the heat-retaining material should not be less than 20mm.

8.4.9 Water-saving appliances should be selected for the domestic hot water system.

8.4.10 The water filling pressure of the heating water system should not be smaller than 0.1MPa.

8.5 Connection of wire (restricted to the burning appliances using commercial power)

8.5.1 Burning appliances should use the 220V ± (10%) ~/50$H_2$ single-phase AC power.

8.5.2 All connecting pipes of burning appliances shall not serve as the grounding wires of electrical appliances.

8.5.3 Burning appliances using Type I anti-shock protection grade should have

reliable electrical grounding. The grounding measures should meet the requirements set out in the existing related national standards. Type I burning appliances should also be inspected to determine whether grounding wire is reliable and effective.

8.5.4 The cross-section area of power wire should satisfy the electrical need of maximum power of burning appliances, and should not be small that $3 \times 0.75mm^2$. Inspection can be made according to the specifications and dimensions of the power wire specified on the manual.

8.5.5 The connection of power wire has to pay attention to the polarity of power wire. Live wire (L) — brown wire; naught wire (N) — blue wire; and earth wire (E) — yellowish green wire. Type I burning appliances have to adopt the single-phase three-hole socket. When facing the socket, the right hole connects with the live wire, the left hole connects with the naught wire, and the upper hole connects with the ground wire. The installation way should be "nought for the left, live for the right, and earth for the upper."

Comments: The protective grounding can also be indicated by the sign in this pattern, " ."

8.5.6 When the indoor temperature controller uses a 220V power source, the control circuit should be separated from the power system. The temperature controller, whether shutdown or under working conditions, shall not affect the turning on of the anti-freezing function of the heating/hot-water combi boiler.

8.6 Installation of indoor temperature controller (restricted to heating/hot-water combi boilers only)

8.6.1 The heating/hot-water combi boilers should be equipped with indoor temperature/time sequence controller.

8.6.2 The installation location should meet the following requirements:

a) In an area with a stable indoor temperature requiring concentrated heating, Indoor temperature controller can be installed on a well-ventilated wall at a distance of 1.2 ~ 1.5m from the floor, or the signal output box of temperature controller can be placed in the area with temperature for concentrated heating.

b) It should not be installed around the door or window, where it might be affected by a cold wind, or in a place affected by radiator or sunlight radiation, or any area reachable by children.

8.7 Connection of gas supply/exhaust pipe (restricted to the closed-type burning appliances only)

8.7.1 The connection and installation of gas supply/exhaust pipe should meet the requirements of product manual and the related national standards. The gas supply/exhaust pipe and its associated parts should be the original manufacturer's

fittings. The coaxial pipe, detachable pipe (double-head pipe), and its adaptor should be applicable to the installation of equipment.

8.7.2 The establishment of fume clear blade should meet the following requirements:

a) The fume clear blade should be established according to the type and maximum length of gas supply/exhaust pipe as well as the requirements set out in the manual.

b) The specifications, dimensions and place of establishment of the fume clear blade should be correct.

8.7.3 The gas absorption/fume exhaust outlet of gas supply/exhaust pipe can be installed on the wall, roof or flue. It is forbidden to insert the flue into the common flue dedicated for the non-closed-type burning appliances.

8.7.4 The length and resistance coefficient of gas supply/exhaust pipe shall not be greater than any one of the following numerical values indicated in the manual:

a) Actual length (applicable to coaxial pipe);

b) Equivalent length (applicable to detachable pipe);

c) Resistance coefficient (applicable to coaxial pipe and detachable pipe).

8.7.5 When the length of the selected gas supply/exhaust pipe exceeds the allowed maximum length, certain pipe sections should be changed to be the gas supply/exhaust pipe of larger diameter. The resistance of the pipe should be guaranteed as not exceeding the maximum value specified by the design.

8.7.6 When the coaxial pipe is horizontally installed on the external wall, the downward inclination should not be less than 3mm/m, and the effective length of its external pipe section should not be less than 50mm.

8.7.7 The installation of detachable pipe should meet the following requirements:

a) When Type 1 and Type 3 burning appliances are detachable pipes, they should be installed in a zone with a perimeter of 50cm.

b) The gas supply inlet of Type 5 burning appliances should not be installed on the wall with buildings on the opposite side.

Comment: The types of burning appliances should adopt the requirements of CJ/T 228.

8.7.8 The connection of burning appliances with gas supply/exhaust pipe should have guaranteed good airtightness. The connection length should not be less than 20mm.

8.7.9 When the naturally ventilated common flue and the independent flue are to be connected to the gas supply/exhaust pipe, the following requirements should be met:

a) The naturally ventilated common flue and the independent flue are applicable to the closed-type compulsory gas supply/exhaust burning appliances.

b) The structure and dimensions of flue can be confirmed according to the

requirements of the related standards.

c) The flue has good airtightness, no leakage of fume, and good performance in fume resistance and heat resistance. Its heat-retaining performance should be good, and no condensation will be caused.

d) The cross-sectional shape of flue should be circular, square or rectangular. It should be in vertical direction, and has no narrow contracted mouth.

e) Appropriate separation or heat insulation measures should be taken for the flue and the inflammable material.

f) When the common flue is adopted, only one heating/hot-water combi boiler can be installed on each floor, and the total number of combi boilers shall not exceed 6.

g) In the main flue, there should be no mechanical air supply system installed.

h) Under stable working conditions, the entire flue should be situated at a negative pressure situation.

i) At the bottom of the flue, there should be a collection chamber of solid objects and condensed objects at a height below 0.5m with a sealed metallic door.

j) The wind cap of flue should meet the following requirements:

(1) The effective area of the wind cap outlet should be greater than the cross-section area of the flue.

(2) The wind cap outlet should avoid the wind pressure belt (positive pressure zone).

(3) The wind cap outlet should avoid the entry of rain and snow.

8.8 The indoor air exchange equipment (restricted to the open-type and semi-closed-type burning appliances only)

8.8.1 General requirements

8.8.1.1 The fume produced during the burning of gas should be exhausted out of the room through the natural air exchange or the mechanical air exchange. When the natural air exchange cannot meet the requirements, mechanical air exchange should be used.

8.8.1.2 The air exchange equipment inside a building should be selected according to the type of burning appliance, type of building, and other conditions. The performance and structural type of the air exchange equipment should satisfy the need of gas exhaust, and meet the requirements of the related standards.

8.8.2 Gas supply/exhaust facility

8.8.2.1 The gas supply/exhaust facility of the gas burning appliances for domestic use should meet the following requirements:

a) The mechanical air exchange facilities, such as air exchange fan, range hood,

and so on, should be adopted. The wind pressure (static pressure) and wind volume of air exchange facility should meet the following requirements:

(1) The wind pressure (static pressure) should be greater than 80Pa;

(2) The wind volume should be confirmed according to the heat discharge of the cooking appliances. When using the air exchange fan, the wind volume should not be smaller than $40m^3$/1kW. When using the range hood, the wind volume should not be smaller than $30m^3$/1kW.

b) The installation of mechanical air exchange facilities, such as air exchange fan, range hood, and so on, should meet the following requirements:

(1) The position of the gas exhaust outlet of air exchange fan should be within 0.8m below the ceiling indoors. The gas supply inlet should be at a suitable position indoors.

(2) The fume exhaust hood of the range hood should be installed at a distance of less than 1m from the stove surface, with an ideal distance of 0.8~0.9m. The gas supply inlet should be at a suitable position indoors.

The fume of the range hood can be horizontally exhausted through the external wall, and can also be vertically exhausted through the building. The air shaft should be equipped with a device preventing the backflow of fume and the tainting of odour (voltage change device or non-return device, etc.).

8.8.2.2 The gas supply/exhaust facilities of gas-fired water heaters for domestic use should meet the following requirements:

a) The flue for natural fume exhaust should meet the following requirements:

(1) The draft (surplus pressure) should not be below 3 Pa;

(2) The fume temperature of the fume exhaust outlet should be greater than $180^oC$, and should be smaller than $260^oC$.

(3) The fume exhaust temperature of the chimney outlet should be higher than the dew point of fume by above $15^oC$.

(4) When using the common flue, the structure of the flue should be in a way that the main and branch flues are juxtaposed. The height of the branch flue should be at floor height, and its net cross-section area should not be less than $0.015m^2$. The net cross-section area of the main flue should be confirmed through calculation under the prerequisite that the draft of flue is guaranteed.

b) The flue for mechanical fume exhaust should meet the following requirements:

(1) The static pressure at the wind machine outlet of the mechanical fume

exhaust shall not be less than 80 Pa (semi-closed-type compulsory gas-exhaust water heater). The position of the flue outlet in the case of horizontal exhaust should meet the requirements of GB 50028;

(2) When using a common flue for the vertical exhaust, the structure of the flue should ensure the juxtaposition of the main and branch flues. At the interchange of the main and branch flues, there should be the installation of an anti-backflow fume device with reliable performance. It is suggested to select the jet plate with eradiation function (Venturi absorption device) and the reliable non-return one-way valve (check valve, non-return valve).

With regard to the fume inlet (at the interchange of the main and branch flues) of the flue co-used by several water heaters, the static pressure value when the water heater is not used should be less than or equal to 0.

8.9 Installation of the alarm and automatic cut-off valve

8.9.1 The installation of the gas and CO concentration detection alarm should meet the following requirements:

a) When testing gas that is lighter than air (artificial gas, natural gas, and so on) and fume, the horizontal distance between the detection alarm and burning appliances or valve should be within the range of 1~8m. The height of installation should be within the range of 0.3m from the ceiling. The alarm should not be installed above burning appliances. The distance between the alarm and the door or window hole should be greater than 0.5m.

b) When testing gas that is heavier than air (liquefied petroleum gas/LPG, LPG-air mixture, and so on) and fume, the horizontal distance between the detection alarm and burning appliances or valve should be within the range of 0.5~4m. The height of installation should be within the range of 0.3m from the floor. The distance between the alarm and the door or window hole should be greater than 0.5m.

c) The technical indicators of the gas/CO complex detector (including the independent detector) should meet the requirements of the related national standards.

8.9.2 The installation of the emergency automatic gas cut-off valve should meet the following requirements:

a) The automatic cut-off valve should be installed in front of the gas meter (with the exception of smart gas meters with automatic cut-off function);

b) There should be a hand-operated cut-off valve in front of the automatic cut-off valve.

8.9.3 The emergency automatic cut-off valve should adopt the product of low voltage

(• 24V), pulse switch, on-the-spot manual switch type. Its technical indicators should meet the requirements of the related national standards. When an air exhaust device is installed, after the emergency automatic cut-off valve is turned off, the air exhaust device should be turned on automatically.

**GB xxxx.2-200X**

# Safety Management Regulations of Gas Burning Appliances

## 1 Scope

This Standard sets the safety requirements for gas burning appliances and the fittings of gas burning appliances for domestic use (simply called burning appliances and fittings), the responsibilities and obligations for the producers of burning appliances, sellers of burning appliances, suppliers of gas, fixers of burning appliances, and consumers of burning appliances, the installation, inspection and acceptance of burning appliances, the use, upkeep, maintenance, scrap judgement and accident handling of burning appliances, the handling, recycling, reuse and recirculation requirements of the scraped gas appliances, and the limits of hazardous and toxic substances as well as the pollution control for the electronic information products and materials in burning appliance products.

This Standard applies to the safety management of local and foreign burning appliances and fittings using city gas as well as the judgement of responsibilities in the cases of accidents.

## 2. Normative references

The provisions of the following documents become provisions of this Standard after being referenced. For dated reference documents, all later amendments (excluding corrigenda) and versions do not apply to this Part; however, the parties to the agreement are encouraged to study whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Standard.

GB/T 16411-2006 Classification of city gas

GB/T 20000.4-2003 Guide for standardization — Part 4: Safety aspects for their inclusion in standards

CJJ 12-2000 Rules for installation, inspection and acceptance of gas burning appliances for domestic use

SJ/T11363-2006 Requirements for Concentration Limits for Hazardous Substances in Electronic Information Products

SJ/T11364-2006 Marking for Control of Pollution Caused by Electronic Information Products

SJ/T11365-2006 Testing Methods for Regulated Substances in Electrical and

Electronic Products

## 3 Safety and environmental requirements of burning appliances and fittings

3.1 Under normal conditions of use, the burning appliances and fittings shall not cause any hazard to the life and health of consumers, shall not create any loss to properties, and shall not pollute the environment.

3.2 Burning appliances and fittings should meet the safety performance and environmental performance requirements of the related standards.

3.3 The following aspects of safety of burning appliances and fittings should also be noted:

— The gas quality used by burning appliances should be stable. The burning appliances should be correctly installed and correctly used.

— When burning appliances and another kind of product are used together, hazards may arise.

— It should be made clear that the burning appliances are suitable to which kind of consumers. The danger and dangerous nature of such products should be particularly made aware with regard to children, the aged and the disabled.

— The possible risks and the expected risks out of wrong operation during the use of burning appliances should be considered according to the requirements of the standard, GB/T 20000.4-2003.

— For burning appliance products as well as electronic information products and materials in the products produced, sold and imported in the territory of China, pollution and other hazards caused by such products to the environment should be controlled and decreased. The contents of lead, mercury, cadmium, sexavalent chrome, polybrominated biphenyls (PBB) and polybrominated ether (PBDE) should be controlled, and the marking and identification requirements should meet the requirements of this Standard.

— The handling, recycling, reuse and recirculation requirements of the burning appliance products produced, sold and imported in the territory of China should meet the requirements set out in this Standard.

## 4 Responsibilities and obligations

4.1 Responsibilities and obligations of producers

4.1.1 The producers of burning appliances and fittings should comply with the related safety requirements over the design, production and sale of burning appliances and

fittings. The products released to the market should be the safe products.

4.1.2 Towards the foreseen behaviours that may affect the safety of products during the sale, installation and use of products, protection measures have to be taken to protect the safety performance of products from being damaged during the abovementioned processes, e.g., when applying the sealing stamp, sealing wax or adopting the unusual bolt connection.

4.1.3 Because burning appliances and fittings are unsafe products, in case of harm caused to the human body or loss of properties, the producers should bear the related responsibilities.

4.1.4 If the burning appliances and fittings are confirmed to be safe products, and the harm and loss are confirmed to be caused at the fault of the victim, or by the fault of another person deemed responsible for the victim, then the producer concerned may be exempt from or may reject the related compensation responsibility.

4.1.5 The producer is obliged to take part in the safety promotion activity held in times of the release of products to the market, and should especially provide the information of hazards of the burning appliances and fittings, enabling the consumers to know the possibly foreseen hazards during the installation and use of the products, even if some of them are very small hazards.

4.1.6 The producers should bear the responsibilities of the recycling, handling, recirculation and reuse of the scraped burning appliances.

4.2 Responsibilities and obligations of the sellers

4.2.1 The sellers should be responsible and obliged to sell safety conditions and safe fittings on the market.

4.2.2 After a seller selling and importing burning appliances and fittings has been recognised by a foreign enterprise, it immediately becomes the representative of the foreign enterprise. Both the foreign enterprise and the seller should be responsible for the safety of the burning appliances and fittings.

4.2.3 During the selling process, the behaviours of the seller may affect the safety performance of products. Hence, measures have to be taken to guarantee the safety performance of products. The seller is obliged to tell the consumers which measures they should take during the installation and use of the burning appliances and fittings. If necessary, the seller, together with the producer, should offer training, and make investigation and interviews, so as to track, inspect and test the products, and study the complaints about the safety of the products.

4.2.4 If the burning appliances and fittings are confirmed to be safe products, and any harm and loss is confirmed to be caused by the fault of the victim, or the fault of another person deemed responsible for the victim, then the seller concerned can be exempt from or may reject the related compensation responsibility.

4.2.5 The seller is obliged to provide any relevant information to consumers, and should especially provide information pertaining to hazards of the burning appliances and fittings, enabling consumers to know of any possible foreseeable hazards during the installation and use of the products, even if some are very small hazards.

4.2.6 The sellers are obliged to assist the producers of burning appliances in the recycling, handling, reuse and recirculation of the scraped and old gas appliances and fittings.

4.3 Responsibilities and obligations of the gas suppliers

4.3.1 The quality of gas provided by the gas suppliers should meet the related regulations, requirements and commitments.

4.3.2 The gas suppliers are obliged to instil in consumers the knowledge of the safe use of gas.

4.4 Responsibilities and obligations of the fixers and maintenance staff of burning appliances

4.4.1 The installation unit and maintenance unit of burning appliances have to acquire certification.

4.4.2 The fixers and maintenance staff of burning appliances have to be trained, and acquire certification.

4.4.3 The installation and maintenance of burning appliances have to meet the requirements of the related standards and codes.

4.4.4 The fixers and maintenance staff should be responsible for the quality of the burning appliances installed and maintained.

4.4.5 The fixers and maintenance staff are obliged to provide consumers with safety information.

4.5 Responsibilities and obligations of the consumers

4.5.1 After consumers have purchased a burning appliance, they should carefully read the installation manual and user manual, and use the product correctly according to the related requirements set out in the manuals.

4.5.2 The consumers should provide a location for the installation of the product which should meet the installation requirements and should guarantee the normal use of burning appliances.

4.5.3 The consumers should regularly perform routine, simple and operable cleaning and maintenance of burning appliances according to the requirements of the user’s manual.

4.5.4 If a consumer finds any abnormal phenomena with regard to the burning appliances, they should immediately stop using them and promptly contact the seller or producer to achieve technical support and protection.

4.5.5 If an accident occurs, the scene must be well retained and the related authorities

should be reported.

4.5.6 The consumers should consider the possible risks that may happen to children, the aged and the handicapped during use of the product.

## 5 Inspection of burning appliances and fittings

5.1 The type test of burning appliances and fittings should be performed according to the related standards of burning appliances and fittings. The inspection units should be the inspection institutions of burning appliances authorized by the nation.

5.2 The inspection of the burning appliances and fittings that belongs to compulsory product management should be conducted according to Directive No 5 of General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), The People's Republic of China, "China Compulsory Certification (CCC)." The inspection of burning appliances and fittings that belongs to application for product license should be conducted according to Directive No. 19 of AQSIQ, "Measures for the Administration of Manufacturing License for Industrial Products."

5.3 The market supervision and sampling inspection of burning appliances and fittings should be conducted according to Directive No 13 of AQSIQ, "Administration Methods of National Supervision and Spot Check on Product Quality."

5.4 The producers and sellers of burning appliances should apply for gas suitability inspection of the burning appliances using artificial gas from the inspection institution appointed by the local technical quality supervision authorities. For the suitability inspection, it is only required to undergo the inspection of the most unfavourable gas conditions of burning appliances, including incomplete burning, staying away from flame, yellow flame, tempering and CO content in fume. Only if the suitability inspection of the burning appliances is passed, "it is not allowed to restrict the enterprises and individuals of other districts from engaging in the production operation and services, and it is not allowed to restrict the products of other districts from entering the market of the district" "according to the regulations of Clause 15 of "Administration Permit Law, The People's Republic of China."

## 6 Supervision during the installation and maintenance of burning appliances

Supervision during the installation and maintenance of burning appliances should meet the regulations of Article 5 of Directive No 73 of the Ministry of Housing and Urban-Rural Development (MOHURD), the People's Republic of China, "Measures for the Administration of Installation and Maintenance of Gas Burning Appliances," "The construction and administration supervisory departments of the State Council are responsible for the supervisory management work of the installation

and maintenance of the gas burning appliances of the whole nation."

The installation, maintenance, inspection and acceptance of the burning appliances should meet the requirements of standard CJJ 12.

## 7 Maintenance and scrap judgement of burning appliances

7.1 The maintenance company of burning appliances should meet the regulations of Article 23 of Directive No 73 of the MOHURD, "Measures for the Administration of Installation and Maintenance of Gas Burning Appliances," "The enterprises engaging in the maintenance of gas burning appliances should be established by the producers of gas burning appliances, or by the maintenance firms of gas burning appliances established under the authorization of gas burning appliances producers." The maintenance work should meet the regulations of Article 26 of "Measures for the Administration of Installation and Maintenance of Gas Burning Appliances," "The firms engaging in the installation and maintenance of gas burning appliances should establish a sound management system and a normalized service standard."

7.2 When using the burning appliances, users should always observe and pay attention to the situation of use. If there is any abnormal situation found, the user should ask the maintenance unit for reparation immediately. The maintenance stations and gas suppliers having signed contracts with the producers of burning appliances should regularly perform or be authorized by users to conduct safety inspection of burning appliances and safety propaganda, and keep the inspection records. For the problematic burning appliances, written comments on inspection and reparation should be proposed, and the records should be filed. The inspection contents are as follows:

a) The functions of different operation parts of burning appliances, and the age limit of burning appliances;

b) The flame stability during the burning of burner;

c) The function of controller, the normal switch-off function of safety valve, and the safe switch-off function during malfunctioning;

d) The airtightness and draft of the flue, and the airtightness of the connecting pipes of burning appliances;

e) Whether the flue and the gas supply funnel are blocked, and whether the gas exhaust system is smooth;

f) Safety inspection of AC power, and the inspection of the installation environment and grounding conditions of burning appliances;

g) The airtightness and safety of the steel bottle, angle valve, pressure regulator and rubber connecting pipe of liquefied petroleum gas (LPG).

h) Records of maintenance or the replacement of damaged parts.

7.3 Scrap judgement of burning appliances

7.3.1 As from the day the burning appliances are sold, the age limit for the scrap judgement of artificial-gas water heaters is 6 years, whereas the age limit for the scrap judgement of LPG and natural gas water heaters is 8 years. The age limit for the scrap judgement of the burning appliances like stoves, steamers, Chinese cooking stoves, etc. is 8 years. The age limit for the scrap judgement of volumetric water heaters, two-purpose stoves, condensed water heaters, etc. is 8 years. If the age limit for the scrap judgement of products or fittings is specified by the related firms, the scrap judgement is based on the statement of the firms. If the burning appliances or fittings (such as the gas-operated air conditioners, electromagnetic stoves, LPG steel bottles, angle valves, LPG pressure regulators, burning appliances controllers, automatic electromagnetic valves, and so on) do not have any age limit of scrap judgement specified, the age limit of scrap judgement is 10 years based on the related regulations of Article 45 of "Product Quality Law, the People's Republic of China."

7.3.2 For burning appliances such as gas water heaters etc., when one of the following malfunctions continues to occur after inspection and reparation, even if the age limit of scrap judgement is not due, the burning appliances should be still be judged as scrapped:

a) The working conditions of the burner seriously deteriorate. After inspection and reparation, the CO content in fume still cannot reach the related standard code;

b) The burning chamber and the heat exchanger are seriously burned, or flame leaks out of them;

c) Water leakage, gas leakage, and the insulation is broken, causing power leak;

d) After the electronic controller is inspected and repaired, malfunctions still occur.

## 8 Handling of accident

8.1 The handling of accidents related to burning appliances should be carried out according to the regulations set out in Article 29 of Directive No 73 of the MOHURD, "Measures for the Administration of Installation and Maintenance of Gas Burning Appliances," "When any units and individuals have found an accident of burning appliances, they should immediately cut off the power, take the measures of ventilation and fire prevention, and report the situation to the related authorities. According to the regulations of Directive No 10 of MOHURD, 'City Gas Safety Administration Measures' and Directive 62 of MOHURD, 'City Gas Administration

Methods,' the related authorities should investigate the accident. If the cause of the accident is confirmed to be the installation and maintenance problems of the gas burning appliances, the related authorities should ask the installation and maintenance firms of the gas burning appliances to take handling measures according to the related regulations."

8.2 The first witness should retain the scene well, and immediately report the situation to the related authorities for making on-the-spot investigation and sealing the burning appliances.

8.3 The handling of serious accident should be according to the related regulations. The related authorities should form an accident investigation team to carry out the investigation and handling.

8.4 When handling the accidents of burning appliances, there should be 4 technical appraisement certificates issued for the accident according to the related regulations and standards of burning appliances:

— Installation of burning appliances, ventilation for fume exhaust, and airtightness of pipeline (please refer to normative Annex A);

— Use and maintenance of burning appliances (please refer to normative Annex B);

— Supply quality of burning appliances (please refer to normative Annex C);

— Quality of burning appliances (please refer to normative Annex D).

8.5 When inspecting the burning appliances of an accident, after the inspection institution has removed the foreign matters from the burning appliances of the accident, the following tests should be performed according to different accident types:

a) CO intoxication related accidents (the following performance should meet the requirements clearly stated on the related standards of products):

— Airtightness of burning appliances;

— Flame stability;

— CO content in fume.

b) Accident caused by gas leaks:

— When the gas inlet of burning appliances is under the air pressure of 4.2kPa, the leakage should be less than 0.07L/h;

— Inspect the airtightness of the gas pipe and the pipe connecting with the gas appliances.

c) Accident of AC power shock: inspect the installation environment and grounding conditions of burning appliances, and inspect the voltage resistance strength of burning appliances according to the related regulations of GB4706.

8.6 For damage and loss of property caused by the violation of regulations, the responsibilities and compensation should be implemented according to the related regulations of “Product Quality Law, the People’s Republic of China.”

## 9 Handling, recycling, reuse and recirculation requirements of scraped gas burning appliances

9.1 According to the requirements of “Cleaner Production Promotion Law, the People’s Republic of China” and “Law on the Prevention and Control of Environmental Pollution by Solid Wastes, the People’s Republic of China,” the environmental pollution by scraped burning appliance products should be controlled and decreased. The purpose of stipulating the handling, recycling, reuse and material recirculation of the scraped gas appliance is to maintain, protect and improve the quality of the environment, protect the health of human beings and cautiously use the natural resources.

9.2 Pollution control of gas appliance products refers that the following measures should be taken to decrease or eliminate the toxic and harmful substances or elements in gas appliance products, such as lead, mercury, cadmium, sexavalent chrome, polybrominated biphenyls (PBB) and polybrominated ether (PBDE), etc.:

- In the design and production processes, technical measures can be made, e.g. change and study the design plan of product, adjust the technical procedures, change the materials used, renovate the manufacturing methods, etc. Provided that the requirements of product performance are met, adopt harmless, non-toxic or low-harm, low toxic, easily degradable, recyclable and reusable materials, and fully consider the production techniques that are favourable to the maintenance, possible upgrading, easy dismantling, easy reuse and recirculation of products.
- In the design, production, sale and import processes, indicate the names and contents of harmful and toxic substances, and mark the environment friendly age limit of products.
- In the sale and import processes, reject any sale and import of gas appliance products and parts that are not meeting the requirements of this Standard.

  The producer should provide in the product manual the identification information of the components and materials of the product, provide users with the recycling and collection system of the useable scraped gas appliances, tell users not to handle the scraped gas appliances as the unclassified urban scraped objects, propagate to users their helpful action in the handling, recycling, reuse and material recirculation of the scraped

gas appliances, and promote to users the existence of the potential threats of hazardous and toxic substances in the scraped gas appliances against the environment and health of human beings.

9.4 When buying new burning appliance products, the users of the burning appliance products are encouraged to return the scraped gas appliances to the burning appliance producer free of charge on one-to-one foundation. The burning appliance producers are liable to the charges for the handling, recycling, reuse and material recirculation of the scraped gas appliances. The producers should be able to fulfil this obligation independently or through the joining of united plan.

9.5 If the producers of burning appliance products are able to be responsible for the work of handling, recycling, reuse and material recirculation of the scraped gas appliances independently, they are not required to join the united fund plan. As to the producers of burning appliance products without these abilities, when they release their burning appliance products to the market, they should provide a handling guarantee fund of products, preventing the scraped gas appliances from being left behind and passed over to other producers to take over the handling responsibility.

9.6 The united fund plan of the handling, recycling, reuse and material recirculation of the scraped gas appliances should be implemented by a third-party reuse centre organized by the industry association, or by a third-party reuse centre after signing contract with the producers of burning appliance products. The handling and recycling charges for the scraped gas appliances historically left behind shall be proportionally shared independently or through the joining of united fund plan by all the producers during the happening of costs. The united fund plan should not exclude the small-output producers, importers and new producers. The handling guarantee fund of the producers of burning appliance products should be a transparent loan plan with a safe bank account.

9.7 The third-party reuse centre for the handling and recycling of the scraped gas appliances refers to the approved and professional enterprise particularly engaging in the handling, recycling, reuse and material recirculation of the scraped gas appliances. Within one year after each kind of new burning appliance product is released to the market, the producer of the burning appliance product has to provide to the reuse centre with the information of reuse and handling methods of the gas appliance. The required information includes the environment friendly handling methods, maintenance, upgrading, renovation, reuse, etc. Meanwhile, the identification methods of electronic, electrical components and materials, and the electronic and electrical parts with hazardous and toxic substances or elements should be provided.

9.8 Every year the industry association should make statistics on the kinds and quantity of the collected, reused, recycled and recycled scraped gas appliances

released to the market within the nation or province and through different means.

## 10 Requirements of the limits of hazardous and toxic substances as well as the pollution control for the electronic information products and materials in gas burning appliance products

10.1 The electronic information products and materials of gas burning appliances (simply called GBA) have to meet the requirements of the limits of hazardous and toxic substances and the requirements of identification for pollution control specified in this Standard.

10.2 The toxic and hazardous substances or elements in the electronic information products and materials of gas burning appliances refer to the substances or elements, like lead, mercury, cadmium, sexavalent chrome, polybrominated biphenyls (PBB) and polybrominated ether (PBDE), and so on.

10.3 The classification for the basic composing units of burning appliance products is shown in Table 10.3.1, and the related terms and definitions are shown in SJ/T11363-2006.

**Table 10.3.1 Classification of composing units**

| Kinds of Composing Units | Definition of Composing Unit |
|---|---|
| GBA-A | Different homogeneous materials that compose the burning appliance products |
| GBA-B | Metal coated materials of different parts in burning appliance products |
| GBA-C | Small parts or materials that cannot be further dismantled from burning appliance products under the current conditions, generally referring to the products with specifications smaller than or equal to $1.2mm^3$. |

10.4 Requirements for the limits of toxic and hazardous substances

The producers of burning appliance products should carry out the classification of composing units for the parts and materials used by them according to Table 10.3.1, and should control the contents of toxic and hazardous substances according to the requirements of limits indicated in Table 10.4.1. When performing supervisory inspection, the supervisory inspection institution of burning appliance products should dismantle the products to an extent that they meet the requirements of classification specified in Table 10.3.1, and then perform the supervisory test to see if they meet the requirements set out in Table 10.4.1.

**Table 10.4.1 Requirements of limits of toxic and hazardous substances**

| Kinds of Units | Requirements of limits (for those with the limit of quantity value, all units are expressed in weight percentage, wt. %) |
|---|---|

| | |
|---|---|
| GBA-A | In this kind of composing unit, the contents of lead, mercury, sexavalent chrome, polybrominated biphenyls (PBB) and polybrominated ether (PBDE) should not exceed 0.1%, and the content of cadmium should not exceed 0.01%. |
| GBA-B | In this kind of composing unit, the hazardous substances of lead, mercury, cadmium, sexavalent chrome, polybrominated biphenyls (PBB) and polybrominated ether (PBDE) should not be deliberately added. |
| GBA-C | In this kind of composing unit, the contents of lead, mercury, sexavalent chrome, polybrominated biphenyls (PBB) and polybrominated ether (PBDE) should not exceed 0.1%, and the content of cadmium should not exceed 0.01%. |

10.5 The test methods for testing the toxic and hazardous substances in burning appliances should be implemented according to SJ/T 11365-2006.

10.6 The identification requirements for the electronic information products in burning appliance products and the pollution control of material as well as the identification requirements for the environment friendly age limit should be implemented according to SJ/T 11364-2006.

10.6.1 The pollution control marks of burning appliance products should be identified according to the requirements of this Standard. The marks should be clear, identifiable and visible, cannot be easily faded, and cannot be easily removed.

10.7 According to the regulations of “Measures for the Control of Pollution from Electronic Information Products,” the producers of electronic information products and materials should clearly indicate the products with toxic and hazardous substances or elements having entered the market of China. They should adopt the ways of sticking labels and giving explanation on the product manual, telling users or consumers the names, contents, environmental friendly age limit of the toxic and hazardous substances or elements, whether they can be recycled when being discarded, the names of the packaging materials, and other information relating to environmental protection.

10.8 The scope of electronic information products and materials required for identification and explanation are shown in “Classified Commentary of Electronic Information Products” edited by the classified index of electronic information industries, which are confirmed by National Bureau of Statistics of China. The burning appliances’ controller, electromagnetic valve, electronic ignitor, piezoelectric ceramic ignitor, switch of wind pressure, switch of micro drive, temperature and flow sensor, relay, liquid crystal display, circuit board, microprocessor, integrated circuit, discrete component, wire, packaging material, and heat exchanger with lead, etc. must clearly indicate any toxic and hazardous substances or elements.

10.9 The environment friendly age limit of electronic information products refers to

the safe age limit of environmental quality. It only refers to the age limit in which the electronic information products and materials containing toxic and hazardous substances or elements would not cause any leakage or mutation, and would not produce environmental pollution or bring serious damage to human body or properties. The environment friendly age limit is not equivalent to the age limit of safe operation. However, the environment friendly age limit can be the same age limit for the scrap judgement of product. The production day of product is just the first day of the environment friendly age limit. The environment friendly age limit is expressed by the unit of years. The environmentally-friendly age limit of products is specified by the manufacturers themselves.

10.10 When the complete appliance is inspected to be not complying with the regulations of "Administration on the Control of Pollution Caused by Electronic Information Products," the producer of the complete appliance shall be responsible for the non-conformance, and the responsibility of the elements and parts factory shall be traced by the factory of the complete appliance. If the products independently sold by the factory of elements and parts are inspected to be not complying with the regulations of "Administration on the Control of Pollution Caused by Electronic Information Products," the producer of the elements and parts should be responsible for the non-conformance.

10.11 All the electronic information products and materials have to be stuck with a label with name, contents and the related information of the toxic and hazardous substances or elements. When marks are to be stuck on products, tests of products can be made. If the producer is very clear about the contents and the related information of the toxic and hazardous substances or elements, it is not required to perform any tests. The test reports on the contents and the related information of the toxic and hazardous substances or elements can either be the report made by the local test laboratory, or the report made by the foreign test laboratory, provided that the report, identification and the related environmental protection information are correct and complying with the facts.

10.12 Principally, the suppliers of the elements, components or materials purchased locally or from foreign countries for production should undergo the marking and identification of the related environmental protection information. If there is an agreement or contract signed between the suppliers of the elements, components or materials and the downstream producers, the suppliers of the elements, components or materials need not perform the indication. However, the related environmental protection information has to be transmitted to the downstream producers. The downstream producers have to stick the labels on the final products, and give clear indication on the manual of the final products.

10.13 The parts or fixings of burning appliance products are composed of multiple elements, components or materials. It is a combination of elements and components with relatively independent functions. There is a great variety of the kinds of electronic information products, so it is impossible to list out all the parts or fixings of products. Hence, the producers are only required to make a concrete division by following the habitual practice of the industry. It is only required to indicate the contents of the toxic and hazardous substances or elements, and the related information of the products. It is not required to indicate the elements, components or materials of the non-toxic and non-hazardous substances or elements.

# Annex A
# (Normative Annex)

## Installation, fume exhaust and ventilation of gas burning appliances, and airtightness of pipeline

### Table A.1 Installation, fume exhaust and ventilation of gas burning appliances, and airtightness of pipeline

<table>
<tr><td>Product Name</td><td></td><td>Model No</td><td></td><td>Producer</td><td></td><td>Production date</td><td></td></tr>
<tr><td>Serial No.</td><td colspan="2">Item</td><td colspan="3">Contents</td><td>Conclusion</td></tr>
<tr><td rowspan="2">1</td><td colspan="2" rowspan="2">Quality</td><td colspan="3">Certification of installation unit</td><td></td></tr>
<tr><td colspan="3">Recognition of training of fixer</td><td></td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Installation location</td><td>Permitted</td><td colspan="2">Kitchen, external corridor, balcony, outdoors</td><td></td></tr>
<tr><td>Not permitted</td><td>Bedroom, basement, bathroom, the inflammable, explosive and corrosive room</td><td>Area of gas inlet is greater than the area of gas exhaust funnel</td><td></td></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Indoor type burning appliances</td><td>Stove, etc.</td><td>Possess natural gas/fume exhaust hood, or compulsory fume exhaust hood or air exchange fan</td><td>Area of gas inlet is above 9.5cm$^2$/kW</td><td></td></tr>
<tr><td>Natural gas exhaust</td><td>The wind cap of gas/fume exhaust pipe is out of the positive pressure zone of building</td><td></td><td></td></tr>
<tr><td>Compulsory gas exhaust</td><td colspan="2">The gas funnel or fume exhaust hood has linkage action with the gas exhaust fan.</td><td></td></tr>
<tr><td>Natural gas supply/ exhaust</td><td colspan="2">The gas supply/ exhaust funnel is connected to the outdoors or the public flue.</td><td></td></tr>
<tr><td>Compulsory gas supply/exhaust</td><td colspan="2">The gas supply/ exhaust funnel is connected to the outdoors or the public flue.</td><td></td></tr>
<tr><td>4</td><td></td><td>Gas flue</td><td colspan="2">There should be no leakage on the gas flue.</td><td></td></tr>
<tr><td colspan="8">Note 1: For the installation location, fume exhaust and ventilation, please refer to the requirements set out in CJJ12.</td></tr>
</table>

Note 2: The balanced-type burning appliances can be installed inside the bathroom.

Note 3: For the burning appliances using AC power, inspect the electrical environment conditions of the building installed with burning appliances, and whether the electrical grounding of burning appliances is safe.

# Annex B
# (Normative Annex)

## Use and maintenance of gas burning appliances

B.1 Inspect the user's correct use situation of burning appliances according to the requirements set out in the user manual of the burning appliance product.

B.2 Inspect the maintenance situation of burning appliances according to the requirements set out in the user manual of the burning appliance product.

B.3 Inspect the qualifications of the maintenance staff.

# Annex C
# (Normative Annex)

## Quality of gas supply

Table C.1 Kinds of Gas

| Item | Kinds of Gas | Wobbe No | Burning behaviour $C_p$ | Conclusion |
|---|---|---|---|---|
| Artificial gas | 5R 6R 7R | | | |
| Natural gas | 4T 6T 10T 12T 13T | | | |
| Liquefied petroleum gas | 19Y 20Y 22Y | | | |
| Remarks: For gas quality, please refer to GB/T 16411. | | | | |

Table C.2 Pressure of Supplied Gas

| Item | Rated Pressure $p_n$/Pa | Fluctuation Range | Conclusion |
|---|---|---|---|
| Artificial gas | 1000 | 0.75~1.5 $p_n$ | |
| Natural gas | 4T 6T 1000<br>10T 12T 13T 2000 | 0.75~1.5 $p_n$ | |
| Bottled liquefied petroleum gas | 2800 | ± 0.5kPa | |
| Note 1: The liquefied petroleum gas pressure of flue is 0.75~1.5 $p_n$.<br>Note 2: Whether the liquefied petroleum gas pressure regulator is passed, please refer to the requirements of the related standards. | | | |

# Annex D
# (Normative Annex)

## Quality of gas burning appliances

Table D.1 Quality of burning appliances

| Product Name | | Model No | | Producer | | Date or production | |
|---|---|---|---|---|---|---|---|
| Serial No. | Test Item | | | Requirements | | Conditions of gas quality test | Conclusion |
| 1 | Flame stability | Tempering | | Meeting the requirements of the related standards of product. | | 2-3 | |
| | | Yellow flame | | Meeting the requirements of the related standards of product. | | 1-2 | |
| | | Staying away from flame | | Meeting the requirements of the related standards of product. | | 3-1 | |
| 2 | CO content in fume and safe cut-off device | Flue-free burning appliances, e.g. stove, etc. | | The CO content in fume should be less than 0.15%. | | 1-1 | |
| | | Burning appliances with flue, e.g. gas-fired fast water heater, volumetric water heater, two-purpose stove, etc. | | The CO content in fume should be less than 0.20%. | | 1-1 | |
| | | | | When the CO content in fume is less than 0.20%, the safety cut-off device is cut. | | 0-2 | |
| 3 | Airtightness | | | When the inlet of burning appliances is under air pressure 4.2kPa, the leakage should be less than 0.07L/h. | | Air | |
| | Accident of AC power shock | | | The accident of AC power shock is investigated according to the related requirements of GB4706. | | | |
| Remarks: The definition for the condition of gas quality test is shown in the requirements of GB/T 16411. | | | | | | | |